interactive computing

The Newsletter of The Association of Time-Sharing Users
and The Association of Small Computer Users

VOLUME 5, NUMBER 1 JANUARY/FEBRUARY 1979

Time-Sharing Costs

A COST COMPARISON OF COMMERCIAL TIME-SHARING SYSTEMS

A special report prepared for ATSU Members by Real Decisions Corporation

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Enclosed for ASCU Members Who Subscribe to the **BENCHMARK REPORT:**

Benchmarks of the **Datapoint 1170,** including speed tests, "real life" problems, ease-of-use tests, and user comments.

Interactive Computing is published every other month by the Association of Time-Sharing Users, Inc., P.O. Box 9003, Boulder, CO 80301. Second-class postage paid at Boulder, CO

A COST COMPARISON OF

COMMERCIAL TIMESHARING SYSTEMS

January, 1979

Preface

The Association of Time Sharing Users (ATSU) has commissioned Real Decisions Corporation (RDC) to develop this special report covering a cost comparison of the results of running one benchmark-type program on seventeen (17) different timesharing services. The objective of this report is to demonstrate the necessity of running benchmarks on prospective vendors' services as part of the total evaluation effort. RDC regularly runs standardized benchmark-type programs on Remote Computer Services vendors and periodically publishes the results. ATSU specifically requested this special report to be focused on one of RDC's standard benchmark programs. Users are cautioned not to construe these results as being representative of any particular vendor's capabilities or cost profile.

Making a decision between vendors of Remote Computing Services comes after a review of your corporate DP history, current facilities and level of satisfaction in line with your basic objectives and long term plans. Once you understand your current workload, project future requirements and establish acceptable standards, you are ready to get down to the serious work of vendor selection or review. There are many elements to consider in determining the right vendor for you and your application. This report only deals with one of those elements - benchmark costs. While costs are only one factor to consider in making a vendor decision, RDC believes that the dramatic differences in costs documented herein provide enough reason to carefully evaluate alternative vendors.

The vendors contained in this report were chosen by RDC on the basis of its experience in the marketplace. RDC does not represent that these seventeen timesharing services comprise an exhaustive list of all such RCS vendors. Other may choose to evaluate different vendors for reasons pertinent to their needs.

From time to time, RDC runs its standard benchmark programs on additional RCS services to expand the list of vendors contained in its reports. Interested vendors should contact RDC for the criteria necessary to be included in future reports.

Vendors included in this Special Report are:

Name	Abbr.	Headquarters Location	Hardware Utilized
ADP Network Services, Inc.	ADP	Ann Arbor, MI	DEC
Boeing Computer Services	BCS-C	Morristown, NJ	CDC
Boeing Computer Services	BCS-I	Morristown, NJ	IBM
CallData Systems, Inc.	CDS-D	Woodbury, NY	DEC
CallData Systems, Inc.	CDS-H	Woodbury, NY	Honeywell
Computer Sciences Corporation	CSC	El Segundo, CA	Univac
CompuServe Network, Inc.	CSV	Columbus, OH	DEC
Control Data Corp. (CYBERNET Services)	CYB	Minneapolis, MN	CDC
General Electric Information Services	GE	Bethesda, MD	Honeywell
McDonnell Douglas Automation Co.	MCA	St. Louis, MO	CDC
National CSS, Inc.	NCS	Wilton, CT	IBM
On-Line Systems, Inc.	OLS	Pittsburgh, PA	DEC
Rapidata, Inc.	RAP	Fairfield, NJ	DEC
Service Bureau Company	SBC	Greenwich, CT	IBM
Tymshare, Inc.	TYM-D	Cupertino, CA	DEC
Tymshare, Inc.	TYM-I	Cupertino, CA	IBM
United Computing Systems, Inc.	UCS	Kansas City, MO	CDC

PRACTICES, PROCEDURES AND PROGRAM DESCRIPTIONS

RDC arranged directly with the vendors covered by this report to utilize their services. All runs were performed on 30 cps terminals during the summer and early Fall of 1978. The price schedules quoted were in effect as of November 1978. Where published price lists have been modified since the runs were made, but the underlying pricing algorithm remained unchanged, RDC updated the benchmark costs appropriately without re-running.

RDC recognizes that most vendors offer attractive discounts for large users and long-term commitments. In addition, many vendors offer discounts for running programs at less than interactive services levels or on non-prime time schedules. In order to evaluate any discounted or specially-priced proposals from vendors, however, RDC believes that a user must start by making cost comparisons using the retail or standard rates that timesharing services publish. Therefore, all prices used in this report are based upon the standard prices for interactive computing during prime time as available for beginning or low-usage customers.

All program runs were performed by RDC personnel experienced in benchmarking timesharing vendors. Where more than one valid implementation of the benchmark program's function was possible, RDC sought and employed the recommendations of the vendor's technical assistance staff. In sum, great care was exercised to obtain uniform results for all services.

Run costs shown are for both compilation and execution (including linking and loading, where necessary) - and are not just for execution of pre-compiled programs. The run mode resembles program development more than fixed production. To illustrate that CPU costs are only one part of the total costs for a particular run, arbitrary amounts of connect time and disk storage utilization were added to the run. The following charts and graphs reflect the results of adding the costs of 3 minutes of connect time and 1500 characters of disk storage to the actual CPU costs incurred in running the benchmark program.

The standard BASIC version of the New Product Planning Problem (used in the RDC report "Financial Modeling Decisions," published December 1978) was selected for the purpose of this report. A description of this problem follows:

New Product Planning Problem

The market research department of a major company is evaluating the profitability of a new product over the next four (4) years. A model is created as follows:

STARTING POINT		MODEL'S ACTION
Units Sold = 50,000	---	Increase 15% Per Year
Selling Price = $8.50	---	Increase $.50 Per Year
Variable Costs per Unit	---	Inflation for next 3 years at 7%, 8%, 6%
-Raw Materials = $3.00		
-Direct Labor = $2.00		
-Packaging = $0.50		
-Distribution = $0.75		
Fixed Costs	---	Constant for 4 years
-Factory = $25,000		
-Other = $15,000		
Effective Tax Rate = 22%	---	Constant %

A base line run is established, and several parameters are varied in a "what-if" mode on subsequent runs. Program output runs two to three pages and is printed in a standard report format of report line items across column years.

VENDOR COSTS FOR CPU, CONNECT, AND STORAGE

AS OF NOVEMBER, 1978

VENDOR	CPU CHARGES	CONNECT/HR AT 30 CPS	STORAGE (1000 CHAR/ MONTH)
ADP	$.02/CRU	$15.00	$1.00
BCS-C	.20/CCU	8.50	0.33
BCS-I	.15/CSU	10.00	0.18
CDS-D	.03/Sec.	8.00	0.39
CDS-H	.10/SRU	11.00	0.38
CSC	.33/SRU	12.50*	0.41
CSV	.023/SRU	15.00	0.49
CYB	.35/SBU	15.25*	0.38
GE	.13/CRU	12.75**	0.11
MCA	.18/MRU	10.00	0.19
NCS	.20/ARU	13.00	0.18
OLS	.05/CPU	10.00	0.47
RAP	.07/CPU	13.00	0.60
SBC	.18/PU	15.00	0.66
TYM-D	.13/TRU	13.00	0.45
TYM-I	.27/TRU	13.00	0.14
UCS	.15/SU-B	22.00	0.24

*Net charge based upon 25,000 characters/hour

**Metro Access Option 2 at 25,000 characters/hour

COMPARATIVE COST TABLE

NEW PRODUCT PLANNING PROBLEM

BASIC LANGUAGE

VENDOR	CPU COST	% OF HIGH VENDOR	CONNECT COSTS (3 Min.)	STORAGE COSTS (1500 CHAR)	TOTAL COST	% OF HIGH VENDOR
ADP	$.88	55%	$.75	$1.50[1]	$3.13	100%
BCS-C	.80	50[2]	.43	.50	1.73	55
BCS-I	.41	26	.50	.27	1.18	38
CDS-D	.21	13	.40	.59	1.20	38
CDS-H	.20	13	.55	.57	1.32	42
CSC	.36	23	.63	.62	1.61	51
CSV	.56	35	.75	.74	2.05	65
CYB	.41	26	.76	.57	1.74	56
GE	.71	44	.64	.17	1.52	49
MCA	.34	21	.50	.29	1.13	36
NCS	.72	45	.65	.27	1.64	52
OLS	1.60	100[2]	.50	.71	2.81	90
RAP	.93	58	.65	.90	2.48	79
SBC	.36	23	.75	.99	2.10	67
TYM-D	.89	56	.65	.68	2.22	71
TYM-I	1.20	75	.65	.21	2.06	66
UCS	.18	11	1.10[3]	.36	1.64	52

Selected qualifying notes to illustrate need for broader evaluation:

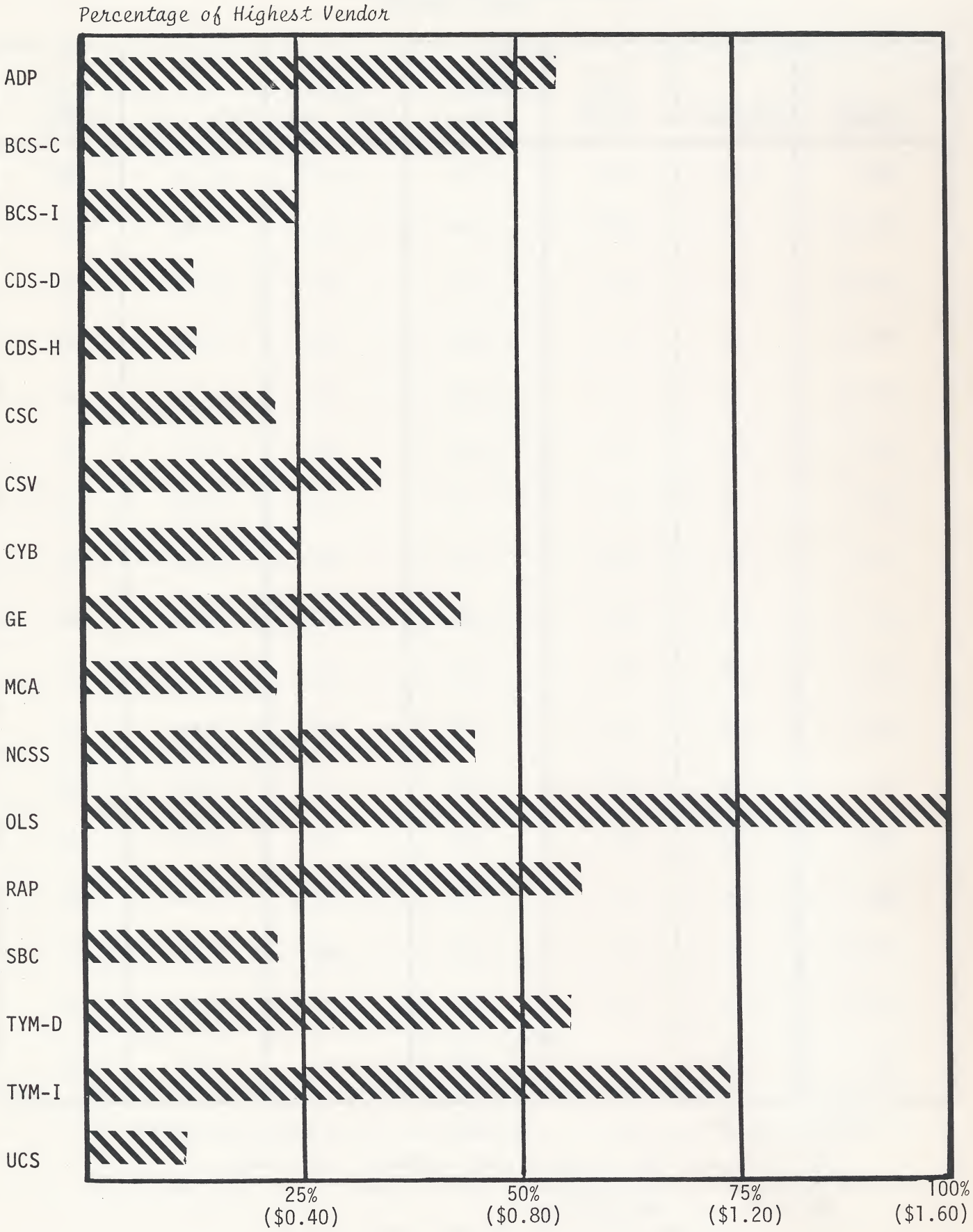
[1] ADP storage volume discounts yield dramatic reductions.

[2] The costs for these vendors on this program are not consistent with RDC's general cost profiles.

[3] UCS price change 1/1/79 will reduce connect charges.

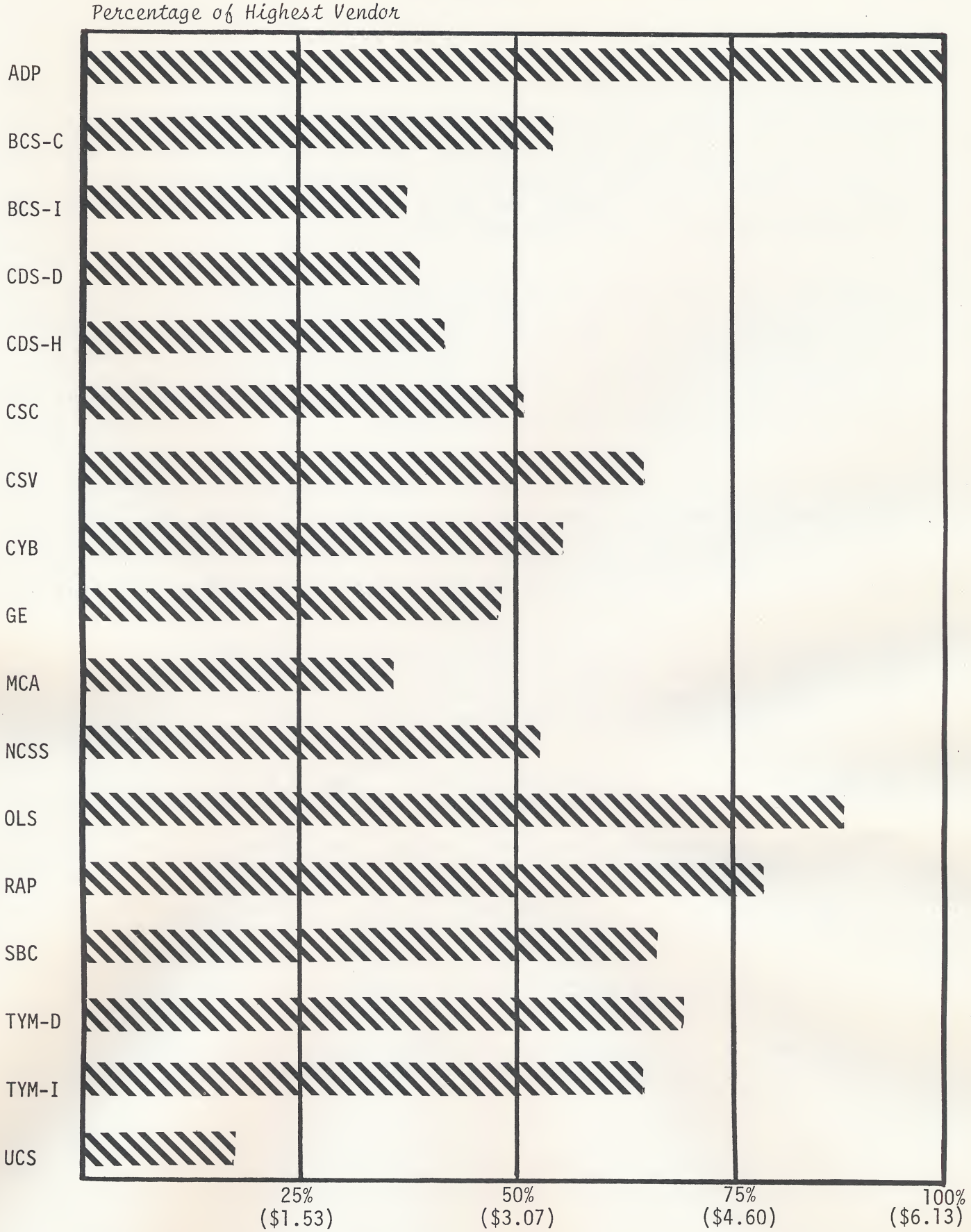
CPU COSTS

NEW PRODUCT PLANNING PROBLEM



TOTAL COSTS

NEW PRODUCT PLANNING PROBLEM



CONCLUSIONS

The preceding graphs illustrate quite dramatically the differences in costs associated with running only one program on seventeen different RCS vendors. These kinds of differences justify careful evaluation of all pricing elements when choosing a particular vendor's service. Note how the cost relationships of these vendors change when factors such as connect and storage costs are added to total CPU costs. Vendors who appear high based solely on CPU costs can dramatically shift on the total cost graph, and vice versa.

In addition, this problem is only one of a series of benchmark type programs which a user must run in order to gain an accurate cost profile of any particular vendor's service. RDC itself runs many benchmark programs designed to test various combinations of CPU time and memory, I/O file uses, and computational speeds. Furthermore, BASIC is only one of the languages used in timesharing and, in fact, vendors often display entirely different cost results for programs coded in FORTRAN versus BASIC.

Users are encouraged to devise additional benchmark programs which will not only provide more complete vendor cost profiles, but also display ease of use characteristics relative to the various Command and Editor facilities. RDC strongly recommends that users perform extensive benchmarking tests which reflect their particular requirements for Remote Computer Services.

ATSU readers are urged to use the results presented in this special report with caution. The main purpose of this report is to stimulate users to perform extensive benchmarks prior to selecting vendors for their use because the fact is that costs do vary widely from vendor to vendor.

The value of a service is determined by a combination of factors in the decision process, weighted by the specific user needs. It is important:

- To understand the PROFILE of a vendor - his business foundation, emphasis and practices;
- To examine the FACILITIES - that specific set of hardware, software and network utilized;
- To evaluate the available SUPPORT - types of personnel, applications and educational help;
- And, with this background, PERFORMANCE can be judged - based on user references, economy of operation and overall service capabilities.

In sum, the evaluation of factors described within the specific decision process will result in the following equation:

PROFILE + FACILITIES + SUPPORT + PERFORMANCE = CHOICE

The processes described above represent some of the analyses users should perform when deciding among potential vendors of Remote Computer Services. Note that one specific aspect of PERFORMANCE deals with economy, and one factor under economy concerns benchmarks - a procedure widely used to test efficiency, measure response time and evaluate costs of various services. It is this specific economic factor - benchmarks - which this report addresses. Results from such benchmark efforts can contribute to the overall task of evaluating competing services, but the proper use of benchmarks is essential. They are certainly not the whole story, and total results must still determine each user's choice.

EDITORIAL

*I'm constantly amazed at the incredible difference in prices between remote computing suppliers. As the chart on page 7 shows, a short test program that costs $1.13 on one service costs $3.13 on another. But what about the results of other test programs, or better yet, larger "real life" programs? The amazing fact is that the results change dramatically as different types of programs are run on each supplier's system. Referring to RDC's 124 page report entitled "The 1978-1979 Comparative Time-Sharing Cost Analysis Report," (available for $695 from RDC) we find that ADP Network Services and On-Line Systems — both of whom had deceptively high prices on page 7 — each had **very low** prices for other types of programs. This seems to be telling us two things: First of all, that we should not jump to conclusions about any particular supplier based upon one example of **someone else's** benchmark program, and secondly, that what really counts is how the suppliers compare with one another using **your own** applications programs. Clearly, this study all by itself cannot be the sole factor considered in making an intelligent purchase decision. But it again demonstrates the incredible differences between remote computing systems and services — differences which are important for us as users to understand and appreciate.* HS

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